

Listing of Claims:

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Material to be inserted in amended claims is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) in double brackets [[]].

Please cancel claims 5 and 6, without prejudice.

Please amend claims 1-4, 7, 17, and 50 as set out below.

Please add new claims 51-60.

1. (Currently Amended) A method of detecting addition or removal of a phosphate group to or from a substrate, comprising:

contacting a luminescent peptide with a binding partner that binds specifically to the peptide only if the peptide is phosphorylated, ~~or only if the peptide is not phosphorylated~~, wherein the binding partner includes an entrapped metal **that selectively binds to phosphorylated peptides**, and wherein the peptide is a substrate for an enzyme that catalyzes addition or cleavage of a phosphate group to or from **the peptide** ~~a protein~~; and

measuring luminescence polarization from the luminescent peptide, wherein the amount of measured luminescence polarization can be related to the extent of binding between the luminescent peptide and the binding partner.

2. (Currently Amended) The method of claim 1 further comprising correlating **the measured** luminescence polarization with kinase activity.

3. (Currently Amended) The method of claim 1 further comprising correlating **the measured** luminescence polarization with phosphatase activity.

4. (Currently Amended) The method of claim 1, wherein the peptide has **no more** ~~fewer~~ than about 15 amino acids.

5. (Canceled)

6. (Canceled)

7. (Currently Amended) The method of claim 1 ~~further comprising providing~~, **wherein there is** at least one phosphate group on the luminescent peptide, and ~~competing with the luminescent peptide by~~ **further comprising** catalyzing **the** formation of unlabelled phosphorylated protein **to competitively bind to the binding partner**.

8. (Original) The method of claim 1, wherein the binding partner binds specifically to a phosphorylated protein substantially without regard to the particular amino acid sequence of the protein.

9. (Previously Presented) The method of claim 1, wherein the binding partner comprises a macromolecule that includes entrapped metal ions.

10. (Previously Presented) The method of claim 9, wherein the metal ions comprise gallium.

11. (Canceled)

12. (Original) The method of claim 1, wherein the peptide is amidated on one end.

13-16. (Canceled)

17. (Currently Amended) The method of claim 1, **wherein the step of measuring luminescence polarization includes** ~~further comprising~~ illuminating the sample with polarized light.

18-46. (Canceled)

47. (Previously Presented) The method of claim 1 further comprising:

exposing the luminescent peptide to the enzyme, in a reaction mixture, to catalyze phosphorylation or dephosphorylation of the peptide; and

adding a stop solution to the reaction mixture, following the step of exposing, to stop the reaction catalyzed by the enzyme;

wherein the step of measuring luminescence polarization is performed, at least in part, after the steps of exposing and adding.

48. (Previously Presented) The method of claim 47, wherein the stop solution includes a chelator.

49. (Previously Presented) The method of claim 1, wherein the steps of contacting and measuring are performed in a microplate well.

50. (Currently Amended) A method of detecting addition or removal of a phosphate group to or from a substrate, comprising:

contacting a luminescent peptide with a binding partner that binds specifically to the peptide only if the peptide is phosphorylated, ~~or only if the peptide is not phosphorylated~~, wherein the binding partner includes gallium involved in binding between the binding partner and the peptide, and wherein the peptide is a substrate for an enzyme that catalyzes addition or cleavage of a phosphate group to or from the peptide ~~a protein~~; and

measuring luminescence polarization from the luminescent peptide, wherein the amount of measured luminescence polarization can be related to the extent of binding between the luminescent peptide and the binding partner.

51. (New) The method of claim 50 further comprising correlating the measured luminescence polarization with kinase activity.

52. (New) The method of claim 50 further comprising correlating the measured luminescence polarization with phosphatase activity.

53. (New) The method of claim 50, wherein the steps of contacting and measuring are performed in a microplate well.

54. (New) The method of claim 50, wherein the step of measuring luminescence polarization includes illuminating the sample with polarized light.

55. (New) The method of claim 50 further comprising:
exposing the luminescent peptide to the enzyme, in a reaction mixture, to catalyze phosphorylation or dephosphorylation of the peptide.

56. (New) The method of claim 55, wherein there is at least one phosphate group on the luminescent peptide, further comprising catalyzing the formation of unlabelled phosphorylated protein in the reaction mixture to competitively bind to the binding partner.

57. (New) The method of claim 55, wherein the binding partner binds specifically to a phosphorylated protein substantially without regard to the particular amino acid sequence of the protein.

58. (New) The method of claim 55 further comprising:
adding a stop solution to the reaction mixture, following the step of exposing, to stop the reaction catalyzed by the enzyme, wherein the stop solution includes a chelator.

59. (New) The method of claim 50 further comprising contacting at least one of the luminescent peptide and the enzyme with a candidate modulator, prior to the step of measuring luminescence polarization.

60. (New) The method of claim 1 further comprising contacting at least one of the luminescent peptide and the enzyme with a candidate modulator, prior to the step of measuring luminescence polarization.